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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/522,707 03/10/00 HIRAMATSU

K 2185-0408P-S

EXAMINER

MM91/1108

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ART UNIT

PAPER NUMBER

2815

DATE MAILED:

11/08/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/522,707

Applicant(s)
Hiramatsu et al.

Examiner
William Baumeister

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2815



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Oct 1, 2001
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Mar 10, 2000 is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on Oct 1, 2001 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other:

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DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 10/01/01. These drawings are approved subject to the following correction.

a. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Claim Objections

2. Claims 3-9 are objected to because of the following informalities:

a. each of claims 3-9 contains the typographical error, "set fourth (sic: forth)."

Appropriate correction is required.

b. Claim 4 sets forth " $0.01 \leq w$." As such, the recitations " $u \leq 1$ " and " $v \leq 1$ " should read " $u < 1$ " and " $v < 1$," respectively.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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4. Claims 1-3, 5, 6, 8 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Mauk '088. Mauk discloses epitaxial lateral overgrowth (ELOG) structures which employ an ELOG mask for growing III-V device layers over III-V epitaxial layers. The III-V layers may be composed of GaN or its alloys (i.e., AlGaInN) (e.g., col. 1, lines 40- and col. 6, lines 11-). The ELOG mask may be composed of metal such as tungsten or a multilayer structure composed of a metal and a dielectric layer (e.g., col. 5, lines 15- ; col. 6, lines 33- and col. 9, lines 1-).

a. Mauk does not disclose or discuss that GaN-based materials grown over tungsten masks will possess voids (claim 2) or have a particular x-ray rocking curve profile (claim 1). Nonetheless, since the voids and the rocking curve profile in applicant's invention are attributable to the mask being composed of an uppermost tungsten layer having mask and spacer widths above particular minimum thicknesses (see the specification e.g., pages 9-10), and because these widths are disclosed by Mauk (e.g., col. 5, lines 50-), the structure of Mauk must also inherently or necessarily possess these features.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mauk '088.

a. Regarding claim 4: Assuming *arguendo* that the passage of Mauk setting forth GaN and its alloys must be read so narrowly as only disclosing GAN and InGaN--but not expressly disclosing Al(GaIn)N--thereby precluding an anticipation rejection, claim 4 would nonetheless still be obvious over Mauk. It was well known to those of ordinary skill in the art at the time of the invention to form LEDs, LDs and other electronic devices from AlN-based materials to produce devices having larger bandgaps, and it would have been specifically obvious for one of ordinary skill in the art to form the first epitaxial III-N layer of an AlN-based composition for the purpose of providing a substrate which would be better lattice-matched to the AlN-based epitaxial layers grown thereon.

b. Regarding claim 7: As was mentioned, Mauk discloses that multilayer masks may be employed and expressly discloses metals such as tungsten on dielectric layers. Mauk does not appear to specifically state that the dielectric layer for such a multilayer mask should be SiO₂. Nonetheless, it was well known to those of ordinary skill in the art at the time of the invention that SiO₂ is one of the most common materials employed as an ELOG mask in III-N semiconductor devices. This position is supported by applicant's prior art admissions (see e.g., FIG 1 and the BACKGROUND of the INVENTION section of the specification). Given that Mauk teaches metals over dielectrics, it would have been obvious to one of ordinary skill in the art at the time of the invention to specifically employ SiO₂ as the dielectric layer for any of the

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various reasons set forth in Mauk (such as to serve as a diffusion barrier) since this is the most common material already used, it is relatively inexpensive, and its chemical properties are well understood by those in the semiconductor industry.

Double Patenting

7. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

8. Claims 1-9 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-9 of copending Application No. 09/396,942. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

9. Claims 1-9 of this application conflict with claims 1-9 of Application No. 09/396,942. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one

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application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

INFORMATION ON HOW TO CONTACT THE USPTO

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, **B. William Baumeister**, at (703) 306-9165. The examiner can normally be reached Monday through Friday, 8:30 a.m. to 5:00 p.m. If the Examiner is not available, the Examiner's supervisor, Mr. Eddie Lee, can be reached at (703) 308-1690. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

B. William Baumeister

November 3, 2001



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